



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/506,311

09/01/2004

Kenji Kondo

5077-000222/NP

8337

27572 7590 11/17/2009  
HARNESS, DICKEY & PIERCE, P.L.C.  
P.O. BOX 828  
BLOOMFIELD HILLS, MI 48303

EXAMINER

THIRUGNANAM, GANDHI

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

11/17/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/506,311	<b>Applicant(s)</b> KONDO ET AL.	
	<b>Examiner</b> GANDHI THIRUGNANAM	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-9 and 11-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Remarks***

1. The response received on 03 September 2009 has been placed in the file and was considered by the examiner. An action on the merits follows.

Applicant has amended claims 1, 8, 11 and 15-17. No claims have been canceled. Claims 1-9 and 11-17 are pending.

The Examiner withdraws all 35 USC 112 second paragraph rejections.

### ***Continued Examination Under 37 CFR 1.114***

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03 September 2009 has been entered.

### ***Response to Arguments***

3. Applicant's arguments with respect to claims 1-9 and 11-17 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's claims merely recite the operations of a database (relational model). The difference between a database and Applicant's claimed invention is the use of the ratio of the pupil diameter divided by an iris diameter as a key to identify a person.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims **1-9 and 11-17** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claims 1-9 and 11-17** recites "a pupil diameter/iris diameter ratio". This claim language is unclear. Does Applicant intend "a pupil diameter divided by an iris diameter ratio", "(a pupil diameter) or an (iris diameter ratio)", "a (pupil diameter ratio) or (an iris diameter ratio)", "(a pupil diameter) and an (iris diameter ratio)" or "a (pupil diameter ratio) and (an iris diameter ratio)". For the purpose of Examination, the Examiner assumes Applicant intends "***(a pupil diameter) or an (iris diameter ratio)***"

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 1-5, 7, 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin 2002/0039433, hereafter referred to as Shin.

Regarding **claim 1**, Shin discloses a personal authentication method using iris images, comprising a registration process and an authentication process, the **registration process** including the steps of:

capturing, by a capture device, a plurality of iris images from a registrant; (*Shin, Paragraph 43-44, where a plurality of images are taken at a plurality of luminance values*)

obtaining feature data and a pupil diameter/iris diameter ratio from each of the plurality of iris images and associating the obtained pupil diameter/iris diameter ratio with the corresponding obtained feature data; (*Shin, Paragraph 44, "several iris instances having respective pupil radius from an individual iris, registers the iris instances as the reference iris images at corresponding classes that are classified according to the pupil radius and stores the registered reference iris image in the iris reference iris image storage", where the feature data (iris images) are registered according to the pupil radius; Paragraph 46 discloses the classes are based upon the equation.  $(\text{radius of the iris} - \text{radius of the pupil})/(\text{radius of the pupil})$  and*

using the pupil diameter/iris diameter ratios to index the obtained feature data of the registrant; and (*Shin, Paragraph 0046, Where the classes (index values) is based upon the value  $(\text{radius of the iris} - \text{radius of the pupil})/(\text{radius of the pupil})$* )

performing data registration for the registrant including storing the obtained feature data, the pupil diameter/iris diameter ratios and index relationship between the obtained feature data and the pupil diameter/iris diameter ratio, of the registrant, in an iris database, and (*Shin, paragraph 44, "several iris instances having respective pupil*

Art Unit: 2624

*radius from an individual iris, registers the iris instances as the reference iris images at corresponding classes that are classified according to the pupil radius and stores the registered reference iris image in the iris reference iris image storage”, where the classes (based on the radius of the iris/ radius of the pupil)*

the **authentication process** including steps of:

capturing, by a capture device, an iris image from a person to be authenticated;  
(*Shin, Paragraph 0086, “at least one iris image is inputted at step S410”*)

obtaining feature data and a pupil diameter/iris diameter ratios, of the person to be authenticated, from the acquired iris image; (*Shin, Paragraph 0086, “the image analysis module retrieves corresponding reference iris class from the storage medium and determines whether or not the corresponding iris class exists in the storage medium”, where the image analysis module determines the class (based on the equation in paragraph 46))*

using the pupil diameter/iris diameter ratios of the person to be authenticated to obtain the feature data, as feature data to be collated, that is associated with the pupil diameter/iris diameter ratios of the person to be authenticated from feature data registered in the iris database device; (*Shin, Paragraph 0087, “the image analysis module starts comparing the presented iris image with the reference iris images belonged to the corresponding iris class”*)

comparing the feature data to be collated with the feature data obtained from the person to be authenticated in the authentication process to determine whether or not the person to be authenticated is the registrant. (*Shin, Paragraph 0087, “the image*

Art Unit: 2624

*analysis module starts comparing the presented iris image with the reference iris images belonged to the corresponding iris class" ; Paragraph 0088, "If the condition is satisfied at step S510, the image analysis module 52 displays the approval result at the S520")*

outputting the comparing result through an output device. *(Paragraph 0088, "If the condition is satisfied at step S510, the image analysis module 52 displays the approval result at the S520")*

Shin defines classes to be (radius of iris-radius of pupil/radius of pupil), While Applicant's claim language recites (diameter of pupil/diameter of iris). It is well known that the diameter is twice the radius. It would have been obvious to substitute radius with diameter as the radius is half the value of the diameter.

Regarding **claim 2**, Shin discloses the personal authentication method of claim 1, wherein:

the registration process includes the step of registering the feature data together with the pupil diameter/iris diameter ratio in the iris database in conjunction with the registrant; and *(Shin, Paragraph 14-15)*

the authentication process includes the step of specifying the feature data to be collated from feature data registered in the iris database in conjunction with a registrant by comparing the pupil diameter/iris diameter ratio obtained in the authentication process with the pupil diameter/iris diameter ratio registered together with the feature data. *(Shin, Paragraph 14-15)*

Regarding **claim 3**, Shin discloses the personal authentication method of claim 2,

wherein the registration process includes the step of at least registering three pieces of feature data of the registrant obtained from iris images in a pupil-contracted state, in a normal state, and in a pupil-dilated state, respectively. (*Shin, Paragraph 46, where there are a plurality of classes formed each representing a range of pupil to iris ratio*)

Regarding **claim 4**, Shin discloses the personal authentication method of claim 2, wherein the registration process includes the steps of:

acquiring a plurality of iris images having different pupil opening degrees from the registrant; (*Shin, Paragraph 14*)

obtaining feature data from each of the plurality of acquired iris images; (*Shin, Paragraph 14*) and

collating the plurality of pieces of feature data with each other to select feature data to be registered in the iris database from the plurality of pieces of feature data. (*Shin, Paragraph 14*)

Regarding **claim 5**, Shin discloses the personal authentication method of claim 2, wherein the authentication process is aborted when feature data having a pupil diameter/iris diameter ratio which is close to the pupil diameter/iris diameter ratio obtained in the authentication process by a predetermined difference is not registered for the registrant. (*Shin, Fig. 11*)

Regarding **claim 7**, Shin discloses the personal authentication method of claim 1, wherein the registration process includes the steps of:



acquiring a plurality of iris images having different pupil opening degrees from the registrant; (*Shin, Paragraph 14*)

obtaining a relational expression between feature data and a pupil diameter/iris diameter ratio based on a plurality of pieces of feature data and diameter/iris diameter ratio obtained from the plurality of acquired iris images; (*Shin, Paragraph 14*) and

registering parameters for expressing the relational expression in the iris database in conjunction with the registrant, (*Shin, Paragraph 14*) and

the authentication process includes the step of obtaining a relational expression from parameters registered in the iris database in conjunction with a registrant and assigning the pupil diameter/iris diameter ratio obtained in the authentication process to the relational expression to obtain the feature data to be collated. (*Shin, Paragraph 14-15*)

Regarding **claim 12**, Shin discloses the personal authentication method of claim 11, wherein:

the iris database stores at least one piece of feature data for each registrant together with a pupil diameter/iris diameter ratio; (*Shin, Paragraph 44, "several iris instances having respective pupil radius from an individual iris, registers the iris instances as the reference iris images at corresponding classes that are classified according to the pupil radius and stores the registered reference iris image in the iris reference iris image storage", where the feature data (iris images) are registered according to the pupil radius*) and

at the third step, a pupil diameter/iris diameter ratio registered together with the feature data, which is selected from the at least one piece of feature data registered in the iris database in conjunction with the registrant, is compared with the pupil diameter/iris diameter ratio obtained at the second step to specify the feature data to be collated. (*Shin, Paragraph 14-15*)

Regarding **claim 13**, Oda discloses the personal authentication method of claim 11, wherein:

the iris database stores parameters which express a relational expression between feature data and a pupil diameter/iris diameter ratio for each registrant; (*Shin, Paragraph 14-15*) and

at the third step, a relational expression is obtained from the parameter registered in the iris database in conjunction with a registrant, and the pupil diameter/iris diameter ratio obtained at the second step is assigned to the relational expression, whereby the feature data to be collated is obtained. (*Shin, Paragraph 14-15*)

**Claim 15** is rejected under the same reasoning as claim 1's "Registration Process"

**Claim 11, 16, 17** is rejected under the same reasoning as claim 1's "Authentication Process"

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shin in view of Flom et al. (Patent #4,641,349), hereafter referred to as Flom.

Regarding **claim 6**, Shin discloses the personal authentication method of claim 5,

But Shin does not specifically teach

“wherein when the authentication process is aborted, a preferable condition for capturing an iris image is estimated based on the pupil opening degree index obtained in the authentication process and a pupil opening degree index associated with registered feature data,(*Flom, Col. 11 Line 65- Col. 12 Line 10*) and

the person to be authenticated is advised to re-acquire an iris image under the estimated capturing condition.(*Flom, Col. 12 Lines 11-17*)”

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Oda with Flom for the purpose of getting the best possible image of the eye.

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shin in view of Smith (PGPub 2002/0016839), hereafter referred to as Smith in further view of Bowers (Patent 5,546,529), hereafter referred to as Bowers

Regarding **claim 8**, Shin discloses the personal authentication method of claim 7, wherein:

the registration process includes the step of reducing the number of the parameters before registration; (*Smith, ¶0037*) and

the authentication process includes the step of restoring the reduced number of parameters by interpolation. (*Bowers, Col. 6 Lines 20-54*)

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Shin with Smith to reduce the size of a database.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Shin and Smith with Bowers top be able to receive any sample point between values in a look-up table.

10. Claims 9 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin in view of Nishida (Patent #6,424,746), hereafter referred to as Nishida.

Regarding **claim 9**, Shin discloses the personal authentication method of claim 1, wherein the registration process includes the steps of:

acquiring a plurality of iris images having different pupil opening degrees from the registrant; (*Shin, Paragraph 14*)

But Shin does not specifically teach the concept of a transformation rule (*Nishida, Col 4, Line 53 to Col. 5 Line 16 does not disclose the use of iris images, but does discloses use of transformation rule applied to structural features which reads on the feature data.*) in

“specifying registration feature data from a plurality of pieces of feature data obtained from the plurality of acquired iris images and obtaining a transformation rule for transforming the registration feature data to another feature data having a different pupil opening degree index; (*See Nishida Lines above*) and

registering the registration feature data and the transformation rule in the iris database in conjunction with the registrant, (*See Nishida lines above*)

the authentication process includes the step of generating the feature data to be collated using the pupil opening degree index obtained in the authentication process

Art Unit: 2624

based on feature data and a transformation rule registered in the iris database in conjunction with a registrant. (*See Nishida lines above*)

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Shin with Nishida for the purpose of fixing images deformed by noise.

Regarding **claim 14**, Shin discloses the personal authentication method of claim 11, wherein:

But Shin does not specifically teach the concept of a transformation rule

“the iris database stores feature data and a transformation rule for transforming the feature data to another feature data having a different pupil opening degree index for each registrant; (*Nishida, Col. 4 Line 53 to Col. 5 Line 16*) and

at the third step, the feature data to be collated is generated using the pupil opening degree index obtained at the second step based on the feature data and the transformation rule registered in the iris database in conjunction with a registrant. (*Nishida, Col. 4 Line 53 to Col. 5 Line 16*)”

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Oda with Nishida for the purpose of fixing images deformed by noise.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kim (2003/0123711) discloses a generic database.

Oda (6,546,121) (Col. 3 Lines 1-3, " the iris area extraction part calculates a distance to the edge of the iris and the pupil from the center of the pupil, and calculates the iris area"), (Col. 3 Lines 4-9, "The identification code producing part 105 produces identification code by analyzing the luminance distribution of an iris pattern."), (Col. 3 Lines 4-9, "The identification code registering part 106 registers the identification code produced by the identification code producing part 105 in a storage device")

Suzaka (Patent 6,614,919) discloses use of the ratio radius of iris/radius of pupil for identification

Flom 4,641,349 discloses method of authenticating a person based on driving a pupil to atleast one predetermined size (*Col. 5 Lines 22-56, "the pupil is driven to at least one predetermined size at which an image is taken"*). But does not disclose registration of data.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GANDHI THIRUGNANAM whose telephone number is (571)270-3261. The examiner can normally be reached on M-Th, 7:30am to 6pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh M. Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2624

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gandhi Thirugnanam/  
Examiner, Art Unit 2624

/Bhavesh M Mehta/  
Supervisory Patent Examiner, Art  
Unit 2624